Math 220 (section AD?) **Quiz 1** **Fall 2012**

Name Solutions

- You have 15 minutes
- No calculators
- Show sufficient work

1. (3 points) Suppose that $f(x) = \dfrac{1}{\sqrt{5-x}}$ and $g(x) = \sqrt{x-2}$. What is the domain of the composite function $(f \circ g)(x)$?

$(f \circ g)(x) = f(g(x)) = f(\sqrt{x-2})$

$= \dfrac{1}{\sqrt{5-\sqrt{x-2}}}$

$x - 2 \geq 0 \Rightarrow x \geq 2$

$5 - \sqrt{x-2} > 0$

$5 > \sqrt{x-2}$

$25 > x - 2 \Rightarrow x < 27$

domain $(f \circ g)$ is $[2, 27)$

2. (3 points) Given that $f(x)$ is an even function and that $g(x) = (f(x)+3)^5$, is $g(x)$ an odd function, an even function or neither? Give a clear justification for your answer.

$g(-x) = (f(-x)+3)^5$

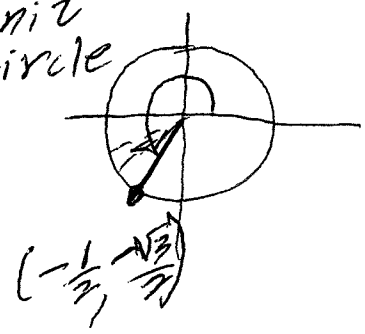
$= (f(x)+3)^5$ since f is even

$= g(x)$

Therefore, g is even

3. (2 points) Evaluate the quantity $\sec(4\pi/3)$.

unit circle



$$\sec\left(\frac{4\pi}{3}\right) = \frac{1}{\cos\left(\frac{4\pi}{3}\right)}$$

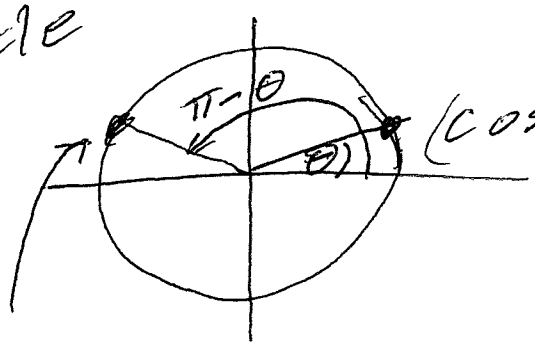
$$= \frac{1}{-1/2}$$

$$= -2$$

4. (2 points) Given an acute angle θ for which $\sin\theta = 1/4$, evaluate the following quantity.

$$\sin(\pi - \theta) + \sin\theta + \cos(\pi - \theta) + \cos\theta$$

unit circle



$(\cos(\pi-\theta), \sin(\pi-\theta))$

note that

$\cos(\pi-\theta) = -\cos\theta$ and

$\sin(\pi-\theta) = \sin\theta$

$$\sin(\pi-\theta) + \sin\theta + \cos(\pi-\theta) + \cos\theta$$

$$= \sin\theta + \sin\theta - \cos\theta + \cos\theta$$

$$= 2\sin\theta$$

$$= 2\left(\frac{1}{4}\right) = \frac{1}{2}$$